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KOVAL', Zh.A.; SHMUL'YAN, I.K.; FROLOV, G.S.

Effect of the material of downcomerless plates on the hydraulic conditions of their performance. Trudy MKHTI no.40, 86-90 '63.
(MIRA 18:12)

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MAN'KOVSKIY, M.V., inzh.; FROLOV, G.V.

Making ice by freezing in layers. Mekh.i avtom.proizv..16 no.5:9-10
62.

(Ice--Manufacture)

(MIRA 16:5)

FROLOV, Georgiy Vasil'yevich; RUSANOVA, M.I., retsenzent; KOLTUNOVA, M.P.,
red.; USENKO, L.A., tekhn. red.

[Establishing technical norms for loading and unloading operations
in railroad transportation] Tekhnicheskoe normirovaniye pogruzochno-
razgruzochnykh rabot na zheleznodorozhnom transporte. Moskva, Vses.
izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniya, 1961.
159 p. (MIRA 14:10)
(Railroads--Freight) (Loading and unloading)

SOV/56-34-3-44/55

AUTHOR: Frolov, G. V.TITLE: Polarization Effects in the Scattering of Electrons by
Protons (Polyarizatsionnye effekt pri rasseyanii elektro-
nov protonami)PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958,
Vol. 34, Nr 3, pp. 764 - 766 (USSR)

ABSTRACT: First, reference is made to the most important points of the work elaborated by Akhiezer, Rozentsveyg and Shmushkevich (Reference 1). The polarizations of the electrons ξ_2^0 and the polarizations of the recoil protons Z_2^0 which occur with the scattering of an electron beam in the polarization ξ_1^0 on protons with the polarization Z_1^0 are calculated in the present report. This makes possible the determination of the real form-factors $a(q^2)$ and $b(q^2)$ (which were introduced into the above-mentioned previous work) from the corresponding experiments. The values of the above-mentioned operators are

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the mean-values of the spin-operators of the particles in that reference system in which the particle rests. The calculations are carried out with the usual methods in which case the mass m of the electron against the proton-mass M and against the initial energy ϵ_1 of the electron in the laboratory system is everywhere neglected. Further, $\theta \gg m/\epsilon_1$ is assumed for the scattering angle θ of the electron in the laboratory system. Rather extensive terms are derived for the polarizations of the recoil protons and of the electrons. Various quantitative conclusions result from these terms. The longitudinal component of the polarization of electrons remains unchanged in the scattering of polarized electrons on unpolarized protons, but the polarization of the recoil protons is caused in this case entirely by the longitudinal component of the polarization of electrons. In the scattering of unpolarized electrons on polarized protons longitudinally polarized electrons are obtained. There is 1 reference, which is Soviet.

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Polarization Effects in the Scattering of Electrons by Proton

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR
(Radium Institute AS USSR)

SUBMITTED: December 14, 1957

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21(7)

AUTHOR:

Frolov, G. V.

SOV/56-37-2-28/56

TITLE:

Polarization Effects in the Elastic Scattering of Electrons
on Deuterons

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 37, Nr 2(8), pp 522-526 (USSR)

ABSTRACT:

The author calculates the differential cross section of scattering and the variation of the polarization of the electrons in the elastic scattering of polarized electrons on polarized deuterons. The experiments described in references 2 and 3 on the elastic scattering of electrons on deuterons permit determination of the form factors of the neutron. The form factors of the nucleons and that of the deuteron as a whole enter the differential scattering cross section of electrons on nucleons. For this reason experiments with polarized particles appear to come in useful in the determination of these quantities. Some of these experiments are described here. In the first section the differential cross section of elastic scattering is calculated. The matrix elements of the interaction of an electron with a nucleon and of the scattering of an electron on a deuteron are written

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down. In the sequel the general case of the scattering of polarized electrons on polarized deuterons is investigated. The initial state is described by the density matrix η_0 , which is the direct product of the electron and deuteron density matrices. For the differential cross section of elastic scattering one obtains:

$$\frac{d\sigma}{d\Omega} = \frac{1}{4} \left(\frac{e^2}{4\pi}\right)^2 \frac{\text{Sp} \left\{ \eta^{(+)}(p_2) S \eta_0 S^\dagger \right\}}{\xi_1^2 \sin^4(\vartheta/2) (1 + \xi \sin^2(\vartheta/2))}$$

where ϑ denotes the scattering angle and $\xi = \xi_1/M$ holds. The scattering cross section of non-polarized particles is given by

$$(\frac{d\sigma}{d\Omega})_0 = \frac{1}{4} \left(\frac{e^2}{4\pi}\right)^2 \frac{f_d^2 N_0 \cos^2(\vartheta/2)}{\xi_1^2 \sin^4(\vartheta/2) (1 + \xi \sin^2(\vartheta/2))}$$

and the form factor of the deuteron by

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$$f_d = \int |\psi_d|^2 e^{iq\vec{r}/2} d\vec{r} = \int_0^\infty u^2 j_0(qr/2) dr \text{ where } j_0 \text{ is the}$$

spherical Bessel function. It is of basic importance that the ratio of the scattering cross sections for polarized and non-polarized particles is independent of the form factor of the deuteron. In the approximation used herein the differential cross section is independent of the transverse component of electron polarization. Although the cross section of the scattering of non-polarized electrons on protons is independent of the polarization of the protons, the influence of deuteron polarization is visible even in the scattering of non-polarized electrons, and azimuthal asymmetry occurs. In the second part the change in polarization of the electrons is calculated. First, the expression for the final polarization ζ_2 of the electrons in the scattering of electrons with the polarization ζ_1 on polarized deuterons is written down. The course of the calculations is similar to that in the deduction of the differential cross section. According to the expressions found herein the final polarization is independent of the

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form factor of the deuteron. The longitudinal and transverse component of electron polarization vary independently from each other in the scattering process. The electrons proved to be longitudinally polarized. Other polarization effects which occur for example in the non-elastic scattering of electrons on deuterons may also be of interest. The author expresses his gratitude to I. M. Shmushkevich for the constant interest shown in this work. There are 5 references, 2 of which are Soviet.

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR
(Radium Institute of the Academy of Sciences, USSR)

SUBMITTED: March 11, 1959

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S/056/60/038/004/014/048
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AUTHOR: Frolov, G. V.

TITLE: Polarization Effects on the Scattering of Electrons by
Deuterons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 4, pp. 1148-1152

TEXT: In a previous paper (Ref. 1) the author calculated the differential cross section and the change of polarization when polarized electrons are elastically scattered by polarized deuterons. In the present paper, the differential cross section and the change in the polarization of electrons is calculated in the case of the disintegration of polarized deuterons induced by polarized electrons, taking into account the electromagnetic form factor of the nucleons. The author considers the interaction of the electrons with a deuteron as an interaction with a bound neutron + proton and studies the interaction matrix in the introduction. The formula developed in the first section shows that the differential cross section does not depend on the transverse component of the electrons.

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Polarization Effects on the Scattering of
Electrons by Deuterons

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From a study of the change in the polarization of the electrons, the author first concludes that the "tensorial" polarization of the deuteron makes only a small contribution to the polarization of scattered electrons. He concludes, further, that if the deuteron is unpolarized initially, the longitudinal polarization component of the electron remains unchanged in the scattering. If the electron is unpolarized initially, longitudinally polarized electrons are attained. Then, an expression is derived giving the polarization of the recoil deuterons when polarized electrons are elastically scattered by unpolarized deuterons. From this expression, the author concludes that the mean value of the spin of the recoil deuteron lies in the plane of scattering. There are 3 references: 2 Soviet and 1 US. ✓

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S/056/60/039/006/056/063
B006/B063

AUTHOR: Frolov, G. V.

TITLE: Polarization Phenomena in the Compton Effect

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 39, No. 6(12), pp. 1829-1836

TEXT: A study of polarization phenomena associated with the Compton effect permits an experimental determination of the scattering amplitudes or a comparison between the scattering amplitudes calculated from dispersion relations, for example, and experimental results. The various quantities entering into the scattering amplitudes and characterizing the polarization phenomena (referred to as polarization coefficients) have to be expressed by the form factors. This problem and a study of the relations between the polarization phenomena, i.e., between these coefficients, were the purpose of the present work. The matrix element of the Compton effect on a nucleon is given as $S_{if} = e_\mu^\dagger e_\nu \bar{u}(p') S_{\mu\nu} u(p)$; e_μ is the polarization vector; k is the photon momentum; p , E , and M are

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the momentum, energy, and mass of the nucleon; the primed quantities refer to the final state; nucleon polarization is characterized by the density matrix $Q_N = \frac{1}{2}(1 + \sum Z)\eta^{(+)}(p)$, $\sum Z = \sum_{\mu} Z_{\mu}$, $\sum_{\mu} = i(\gamma_5)_{\mu\mu}$, $\eta^{(+)}(p) = \frac{M - ip}{2E}\gamma^4$, where $Z_{\mu\nu}$ is the four-vector of nucleon polarization; $\eta^{(+)}$ is the operator of the projection on a state with positive energy. Photon polarization is described by the density matrix $Q_{\beta} = \frac{1}{2}(1 + \xi^i\tau^i)$, where ξ^i are the Stokes parameters, and τ^i are Pauli matrices. With $(M - ip)^2 = 2M(M - ip)$ and $(1 + \sum Z)(M - ip) = (M - ip)(1 + \sum Z)$ the following relations are obtained for polarization phenomena:

for the differential cross section:

$$d\sigma/d\Omega \sim R = Sp((M - ip')S_{\mu\nu}(1 + \xi^i)\tau^i(M - ip)(1 + \sum Z) \times \\ \times (M - ip')\bar{S}_{\beta\mu}(M - ip')); \quad (2)$$

for the polarization of scattered photons:

$$\xi^i R = \tau^i_{\alpha\mu} Sp((M - ip')S_{\mu\nu}(1 + \xi^i)\tau^i(M - ip)(1 + \sum Z) \times \\ \times (M - ip')\bar{S}_{\beta\mu}(M - ip')); \quad (3)$$

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for the polarization of recoil nucleons:

$$Z_\lambda R = Sp \{ \Sigma_\lambda (M - i\hat{p}') S_{\mu\nu} (1 + \xi^\nu)_{\nu\beta} (M - i\hat{p}) (1 + \Sigma Z) \times \\ \times (M - i\hat{p}) \bar{S}_{\beta\mu} (M - i\hat{p}') \}; \quad (4)$$

and for the polarization correlation:

$$Q'_\lambda R = r'_{\alpha\mu} Sp \{ \Sigma_\lambda (M - i\hat{p}') S_{\mu\nu} (1 + \xi^\nu)_{\nu\beta} (M - i\hat{p}) (1 + \Sigma Z) \times \\ \times (M - i\hat{p}) \bar{S}_{\beta\alpha} (M - i\hat{p}') \}. \quad (5)$$

Hence, the following polarization coefficients may be introduced:

$$\begin{aligned} R &= a^l + c^l \xi^l + b_x Z_x + d_x \xi^l Z_x, \\ \xi^l R &= f^l + h^l \xi^l + g^l Z_x + l_x^l \xi^l Z_x, \\ Z_\lambda R &= l_\lambda + m_\lambda^l \xi^l + n_{\lambda x} Z_x + [q_{\lambda x}^l \xi^l Z_x], \\ Q'_\lambda R &= u_\lambda^l + v_\lambda^l \xi^l + x_{\lambda x}^l Z_x + y_{\lambda x}^l \xi^l Z_x. \end{aligned} \quad (6)$$

The polarization coefficients a , l_λ , and c^l have already been expressed by the form factors in a non-covariant manner (L. I. Lapidus and Chzhou Guan-chzhao). M. I. Shirokov and S. M. Bilen'kiy et al. studied the relations following from the T-invariance for the polarization phenomena in a non-covariant manner. Here, all relations between the polarization coefficients for the Compton effect are formulated in a relativistically

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covariant manner. In addition, the relations following from cross symmetry and charge conjugation are studied, and the partly extensive formulas are given in an explicit form. In the following, all polarization coefficients are expressed by the form factors, and

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$$\begin{aligned}
 a &= \alpha_1 (|A_1|^2 + |A_3|^2) - 2\alpha_2 |A_5|^2 - \kappa_1 \kappa_2 (|A_2|^2 + |A_4|^2) + \\
 &\quad + 2\alpha_4 |A_6|^2 + 2\alpha_3 \operatorname{Re}(A_1 A_2^* + A_3 A_4^*), \\
 c^1 &= c^2 = h^{13} = h^{31} = h^{32} = h^{23} = 0, \\
 c^3 &= \alpha_1 (|A_3|^2 - |A_1|^2) - \kappa_1 \kappa_2 (|A_4|^2 - |A_5|^2) - 2\alpha_3 \operatorname{Re}(A_1 A_2^* - A_3 A_4^*), \\
 h^{11} &= -2 \{ \alpha_1 \operatorname{Re} A_1 A_3^* - \kappa_1 \kappa_2 \operatorname{Re} A_2 A_4^* + \alpha_2 |A_5|^2 + \\
 &\quad + \alpha_4 |A_6|^2 + \alpha_3 \operatorname{Re}(A_1 A_4^* + A_2 A_3^*) \}, \\
 h^{12} &= 2 \operatorname{Im} \{ \alpha_1 A_1 A_3^* - \kappa_1 \kappa_2 A_2 A_4^* + \alpha_3 (A_1 A_4^* + A_2 A_3^*) \}, \\
 b_\lambda &= t_\lambda^{33} = 4N_\lambda \operatorname{Im}(A_1 A_2^* + A_3 A_4^*)/M^3, \\
 d_\lambda^1 &= F_\lambda \operatorname{Im} \{ 4(A_3 A_5^* - A_1 A_3^*) + \alpha_2 (A_2 A_6^* + A_4 A_6^*) - \\
 &\quad - \alpha_3 (A_2 A_5^* - A_4 A_5^* + A_1 A_6^* + A_3 A_6^*) \} - \\
 &- 2G_\lambda \operatorname{Im} \{ \alpha_1 (A_1 A_6^* + A_3 A_6^*) - \alpha_2 (A_2 A_6^* - A_4 A_6^*) + \alpha_3 (A_2 A_6^* + A_4 A_6^*) \}, \\
 d_\lambda^2 &= F_\lambda \operatorname{Re} \{ \alpha_2 (A_2 A_6^* - A_4 A_6^*) - 4(A_1 A_6^* + A_3 A_6^*) - \\
 &\quad - \alpha_3 (A_2 A_6^* + A_4 A_6^* + A_1 A_6^* - A_3 A_6^*) \} -
 \end{aligned}$$

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$$\begin{aligned}
 & -2G_\lambda \operatorname{Re} \{ \alpha_1 (A_1 A_6^* - A_3 A_5^*) - \alpha_2 (A_2 A_5^* + A_4 A_5^*) + \alpha_3 (A_2 A_6^* - A_4 A_6^*) \}, \\
 d_\lambda^0 &= 4N_\lambda \operatorname{Im} (A_3 A_4^* - A_1 A_2^* + 2A_3 A_6^*)/M^3, \\
 t_\lambda^{11} &= t_\lambda^{22} = -4N_\lambda \operatorname{Im} (A_1 A_4^* + A_3 A_2^*)/M^3, \\
 t_\lambda^{12} &= 4N_\lambda \operatorname{Re} (A_2 A_3^* - A_1 A_4^* + 2A_3 A_6^*)/M^3, \\
 t_\lambda^{13} &= F_\lambda \operatorname{Im} \{ 4(A_1 A_5^* + A_3 A_6^*) + \alpha_2 (A_2 A_6^* - A_4 A_6^*) + \\
 &\quad + \alpha_3 (A_2 A_5^* + A_4 A_6^* - A_1 A_6^* + A_3 A_5^*) \} - \\
 & - 2G_\lambda \operatorname{Im} \{ \alpha_1 (A_1 A_6^* - A_3 A_5^*) + \alpha_2 (A_2 A_6^* + A_4 A_5^*) + \alpha_3 (A_2 A_6^* - A_4 A_6^*) \},
 \end{aligned}$$

$$\begin{aligned}
 t_\lambda^{23} &= F_\lambda \operatorname{Re} \{ 4(A_3 A_3^* - A_1 A_5^*) - \alpha_2 (A_2 A_6^* + A_4 A_6^*) + \\
 &\quad + \alpha_3 (A_4 A_5^* - A_2 A_3^* + A_1 A_6^* + A_3 A_6^*) \} + \\
 & + 2G_\lambda \operatorname{Re} \{ \alpha_1 (A_1 A_6^* + A_3 A_5^*) - \alpha_2 (A_4 A_5^* - A_3 A_3^*) + \alpha_3 (A_2 A_6^* + A_4 A_6^*) \}, \\
 q_{\lambda x}^1 &= \operatorname{Re} \{ T_{\lambda x} (A_1 A_5^* - A_3 A_3^*) + B_{\lambda x} (A_4 A_5^* - A_2 A_3^*) + \\
 &\quad + C_{\lambda x} (A_1 A_6^* + A_3 A_6^*) - D_{\lambda x} (A_2 A_6^* + A_4 A_6^*) \}, \\
 q_{\lambda x}^2 &= \operatorname{Im} \{ B_{\lambda x} (A_2 A_5^* + A_4 A_3^*) - T_{\lambda x} (A_1 A_5^* + A_3 A_3^*) + \\
 &\quad + C_{\lambda x} (A_3 A_6^* - A_1 A_6^*) + D_{\lambda x} (A_2 A_6^* - A_4 A_6^*) \},
 \end{aligned}$$

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$$q_{\lambda x}^3 = I_{\lambda x} [\alpha_1 (|A_3|^2 - |A_1|^2) - \alpha_1 \alpha_2 (|A_4|^2 - |A_2|^2) - 2\alpha_3 \operatorname{Re}(A_1 A_2^\dagger - A_3 A_4^\dagger)] + \\ + 2H_\lambda G_x \alpha_2 (|A_4|^2 - |A_2|^2) + H_\lambda F_x [4\operatorname{Re}(A_1 A_2^\dagger - A_3 A_4^\dagger + 2A_5 A_6^\dagger) - \\ - \alpha_3 (|A_4|^2 - |A_2|^2)] + L_\lambda G_x [4\operatorname{Re}(A_1 A_2^\dagger - A_3 A_4^\dagger - 2A_5 A_6^\dagger) - \\ - \alpha_3 (|A_4|^2 - |A_2|^2)] + 2M^2 L_\lambda F_x [|A_3|^2 - |A_1|^2 - \alpha_3 \operatorname{Re}(A_1 A_2^\dagger - A_3 A_4^\dagger) - \\ - \alpha_5 (|A_4|^2 - |A_2|^2)] / (pp'),$$

$$n_{\lambda x} = I_{\lambda x} [\alpha_1 (|A_1|^2 + |A_3|^2) + 2\alpha_2 |A_5|^2 - 2\alpha_4 |A_6|^2 - \\ - \alpha_1 \alpha_2 (|A_2|^2 + |A_4|^2) + 2\alpha_3 \operatorname{Re}(A_1 A_2^\dagger + A_3 A_4^\dagger)] + \\ + 2H_\lambda G_x [\alpha_2 (|A_2|^2 + |A_4|^2) + 2\alpha_1 |A_6|^2] - \\ - (H_\lambda F_x + L_\lambda G_x) [4\operatorname{Re}(A_1 A_2^\dagger + A_3 A_4^\dagger) + \alpha_3 (|A_2|^2 + |A_4|^2 - 2|A_6|^2)] + \\ + 2M^2 L_\lambda F_x [|A_1|^2 + |A_3|^2 + 2|A_5|^2 + \alpha_3 \operatorname{Re}(A_1 A_2^\dagger + A_3 A_4^\dagger) - \\ - \alpha_5 (|A_2|^2 + |A_4|^2) - \alpha_6 (|A_6|^2)] / (pp'),$$

$$y_{\lambda x}^{12} = 2\operatorname{Im} \{I_{\lambda x} [\alpha_1 A_1 A_3^\dagger - \alpha_1 \alpha_2 A_2 A_4^\dagger + \alpha_3 (A_1 A_4^\dagger + A_2 A_3^\dagger)] + \\ + 2H_\lambda G_x \alpha_2 A_4 A_6^\dagger - H_\lambda F_x [2(A_1 A_4^\dagger + A_2 A_3^\dagger + 2A_5 A_6^\dagger) + \alpha_3 A_2 A_4^\dagger] - \\ - L_\lambda G_x [2(A_1 A_4^\dagger + A_2 A_3^\dagger - 2A_5 A_6^\dagger) + \alpha_3 A_2 A_4^\dagger] + \\ + M^2 L_\lambda F_x [2A_1 A_3^\dagger + \alpha_3 (A_1 A_4^\dagger + A_2 A_3^\dagger) - 2\alpha_5 A_2 A_4^\dagger] / (pp'),$$

$$y_{\lambda x}^{13} = \operatorname{Re} \{B_{\lambda x} (A_2 A_5^\dagger + A_4 A_6^\dagger) - T_{\lambda x} (A_1 A_6^\dagger + A_3 A_5^\dagger) +$$

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$$\begin{aligned}
 & + C_{\lambda x} (A_1 A_6^* - A_3 A_5^*) - D_{\lambda x} (A_2 A_6^* - A_4 A_5^*), \\
 y_{\lambda x}^{23} = & \text{Im} \{ T_{\lambda x} (A_3 A_5^* - A_1 A_3^*) + B_{\lambda x} (A_2 A_5^* - A_4 A_3^*) + \\
 & + C_{\lambda x} (A_1 A_6^* + A_3 A_5^*) - D_{\lambda x} (A_2 A_6^* + A_4 A_5^*) \}, \\
 y_{\lambda x}^{11} = & 2 \{ I_{\lambda x} [\alpha_2 |A_3|^2 - \alpha_1 \text{Re } A_1 A_3^* + x_1 x_2 \text{Re } A_2 A_4^* + \\
 & + \alpha_4 |A_6|^2 - \alpha_3 \text{Re } (A_1 A_4^* + A_2 A_3^*)] + \\
 & + (H_{\lambda} F_x + L_{\lambda} G_x) [2 \text{Re } (A_1 A_3^* + A_2 A_5^*) + \alpha_3 (\text{Re } A_2 A_4^* - |A_6|^2)] - \\
 & - 2 H_{\lambda} G_x [\alpha_1 |A_6|^2 + \alpha_2 \text{Re } A_2 A_4^*] + M^2 L_{\lambda} F_x [2 |A_5|^2 - \\
 & - 2 \text{Re } A_1 A_3^* - \alpha_3 \text{Re } (A_1 A_4^* + A_2 A_3^*) + 2 \alpha_5 \text{Re } A_2 A_4^* + \alpha_6 |A_6|^2] / (pp'). \quad (15)
 \end{aligned}$$

$$\begin{aligned}
 \alpha_1 &= 4 - x_1 - x_2, \quad \alpha_2 = x_1 + x_2, \quad \alpha_3 = x_1 - x_2, \quad \alpha_4 = x_1 + x_2 - x_1 x_2, \\
 \alpha_5 &= [2(x_1 + x_2) - (x_1 - x_2)^2] / 8, \quad \alpha_6 = [2(x_1 + x_2) + (x_1 - x_2)^2] / 4, \\
 L_{\lambda} &= \left(p_{\lambda} + \frac{(pp')}{M^2} p_{\lambda}' \right) / M, \quad F_x = \left(p_x' + \frac{(pp')}{M^2} p_x \right) / M, \\
 H_{\lambda} &= \left(K_{\lambda} + \frac{(Kp')}{M^2} p_{\lambda}' \right) / M, \quad G_x = \left(K_x + \frac{(Kp)}{M^2} p_x \right) / M,
 \end{aligned}$$

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$$I_{\lambda x} = \delta_{\lambda x} - p_x p'_x / (pp'), \quad T_{\lambda x} = 4ie_{\lambda x \mu \nu} p_\mu p'_\nu / M^2, \quad (16)$$

$$B_{\lambda x} = 4 [ie_{\lambda x \mu \nu} K_\mu Q_\nu + N_x p'_\lambda / M^2 - N_\lambda p_x / M^2] / M^2,$$

$$C_{\lambda x} = 4 [(N_x p'_x + N_\lambda p_x) / M^2 - ie_{\lambda x \mu \nu} K_\mu (p_\mu + p'_\mu) / M^2],$$

$$D_{\lambda x} = [4(N_x K_\lambda + N_\lambda K_x) / M^2 + i(x_1 - x_2) e_{\lambda x \mu \nu} K_\mu (p_\mu + p'_\mu)] / M^2.$$

Отметим, что имеют место следующие равенства:

$$Lp' = Hp' = Fp = Gp = 0, \quad (17)$$

$$\begin{aligned} I_{\lambda x} p_x &= I_{\lambda x} p'_\lambda = T_{\lambda x} p_x = T_{\lambda x} p'_\lambda = B_{\lambda x} p_x = \\ &= B_{\lambda x} p'_\lambda = C_{\lambda x} p_x = C_{\lambda x} p'_\lambda = D_{\lambda x} p_x = D_{\lambda x} p'_\lambda = 0. \end{aligned}$$

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Finally, the formulas obtained are used to calculate the polarization of recoil electrons in the scattering of unpolarized photons by unpolarized electrons. I. M. Shmushkevich is thanked for his interest in the work. A. I. Akhiyezer and V. E. Berestetskiy are mentioned. There are 8 references: 5 Soviet, 2 US, and 1 Dutch.

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR (Radium Institute, Academy of Sciences USSR)

SUBMITTED: July 29, 1960

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FROLOV, G.V.

Polarization effects in the scattering of μ -mesons on protons.
Zhur. eksp. i teor. fiz. 40 no.1:296-297 Ja '61.

1. Radiyevyy institut AN SSSR.
(Mesons--Scattering) (Protons)

FROLOV, G.V.

Relativistically covariant relations of the polarization effects
arising in the scattering of spin 1/2 particles. Zhur.eksp.i teor.
fiz. 40 no.3:943-945 Mr '61. (MIRA 14:8)

1. Radiyevyy institut Akademii nauk SSSR.
(Nuclear spin) (Electrons--Scattering)

FROLOV, G. V.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Technical Physics Institute imeni A. F. Ioffe in 1962:

"Polarization Effects in Electron and Photon Scattering By Nucleons."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

L 10196-63

EWT(1)/FCC(w)/BDS--AIFTC/ASD--IJP(C)

ACCESSION NR: AP3000075

S/0056/63/044/005/1746/1747

AUTHOR: Frolov, G. V.

55

TITLE: Perturbation theory and fermion Regge poles in electrodynamics

53

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1746-1747

TOPIC TAGS: Quantum electrodynamics, Regge poles, fermions, perturbation theory

ABSTRACT: It is shown that the asymptotic behavior due to a fermion Regge pole with definite signature contradicts perturbation theory. This refutes the statements made in a recent paper by Gell-Mann and Goldberger (Phys. Rev. Letters v. 9, 275 1962) that the asymptotic behavior of the amplitude of the Compton effect on an electron can be explained on the assumption that the electron is a Regge pole. It is pointed out that in order to obtain the absence of symmetry that follows from perturbation theory it is necessary to postulate the existence of a fermion Regge pole with negative signature related in a definite manner to a pole with positive signature. "I am deeply grateful to V. N. Gribov for most useful clarifications, and also to the participants in the theory

Card 1/2

L 10196-63

ACCESSION NR: AP3000075

seminar of the Institute of Theoretical and Experimental Physics for discussions." Orig. art. has: 3 formulas.

2

ASSOCIATION: Radiyevyy institut, Akademii nauk SSSR (Radium Institute, Academy of Sciences SSSR)

SUBMITTED: 22Mar63 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF Sov: 001 OTHER: 001

bm/CH
Card 2/2

L 10217-63 EWT(1)/EWT(m)/FCC(w)/
BDS--AFFTC/ASD--IJF(C)

ACCESSION NR: AP3000076 S/0056/63/044/005/1747/1749

AUTHOR: Gorshkov, V. G.; Frolov, G. V.

54
54

TITLE: Asymptotic relations between large-angle scattering cross sections 19

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1747-1749

TOPIC TAGS: Large angle scattering, cross sections, Regge poles, asymptotic relations

ABSTRACT: Relations are established between cross sections of various processes for large-angle scattering, following a hypothesis by Pomeranchuk, similar to the relations already established for small angle scattering, within the framework of the Regge pole method. The processes first considered are the nucleon Compton effect, photoproduction of pions, and pion-nucleon scattering. It is pointed out that in contrast with the narrow-angle relations, the experimental verification of the large-angle relations does not require the scattering of unstable particles on each other. Other processes whose intermediate states are characterized by the same quantum numbers are likewise assumed to be all

Card 1/2

L 10217-63

ACCESSION NR: AP3000076

4

dominated by one principal Regge pole. "We are deeply grateful for numerous useful discussions to V. N. Gribov." Orig. art. has: 6 formulas.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR
(Physicotechnical Inst. Acad. Sci. SSSR), Radiyevyy inst. AN SSSR (Radium Inst.
Acad. Sci. SSSR)

SUBMITTED: 23Mar63 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF Sov: 004 OTHER: 002

Card

2/2

GORSHKOV, V.G.; REKALO, M.P.; FROLOV, G.V.

Fermion Regge poles and the Compton effect. Zhur. eksp. i teor. fiz. 45 no.2:285-290 Ag '63. (MIRA 16:9)

1. Fiziko-tehnicheskiy institut imeni A.F.Ioffe AN SSSR,
Fiziko-tehnicheskiy institut AN UkrSSR i Radiyevyy institut
AN SSSR.

(Protons--Scattering) (Compton effect)

REKALO, M.P.; GORSHKOV, V.G.; FROLOV, G.V.

Photoproduction of π^+ -mesons on nucleons, and fermion Regge poles.
Zhur. eksp. i teor. fiz. 45 no.3:672 S '63. (MIRA 16:10)

1. Fiziko-tehnicheskiy institut AN Ukrainskoy SSR i Fiziko-tehnicheskiy institut imeni A.F. Ioffe AN SSSR.
(Mesons--Scattering) (Nuclear reactions)

ACCESSION NR: AP4042578

S/0056/64/046/006/2132/2140

AUTHORS: Gorshkov, V. G.; Rekalo, M. P.; Frolov, G. V.

TITLE: Fermion Regge poles in processes involving vectons

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 6, 1964, 2132-2140

TOPIC TAGS: Regge pole, fermion, meson, meson scattering, vector meson, vecton

ABSTRACT: The asymptotic value and several relations are obtained for the cross sections of processes involving vector mesons, assuming the existence of one or several Regge poles. The processes considered are scattering of vectons (vector mesons) by nucleons (including photoproduction of vectons), production of vectons by pions on nucleons, and scattering of pions by nucleons. The singularities of the partial amplitudes are analyzed by using the amplitudes for transitions between states having different helicities. Relations

Card 1/2

ACCESSION NR: AP4042578

between the cross sections of the various processes are derived.
"The authors are grateful to Ya. A. Azimov, A. I. Akhiyezer, D. V.
Volkov, and V. N. Gribov for valuable critical remarks." Orig. art.
has: 1 figure, 30 formulas, and 2 tables.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe Akademii
nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 18Dec63

DATE ACQ:

ENCL: 00

SUB CODE: NP

NR REF Sov: 006

OTHER: 003

Card 2/2

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

SERBO, V. V.; TIKHONOV, G.V.

Regge behavior of the scattering amplitude in quantum electrodynamics with a heavy photon. Vest. LGU 20 no.16;36-40 '65.
(MIRA 18:9)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

ACC NR: AP7008892

SOURCE CODE: UR/0386/66/004/008/0321/0325

AUTHOR: Gorshkov, V. G.; Gribov, V. N.; Lipatov, L. N.; Frolov, G. V.

ORG: Physico-technical Institute imeni A. F. Ioffe, Academy of Sciences USSR
(Fiziko-tehnicheskiy institut AN SSSR)

TITLE: Doubly logarithmic asymptotic behavior in quantum electrodynamics

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v
redaktsiyu, v. 4, no. 8, 1966, 321-325

TOPIC TAGS: asymptotic property, quantum electrodynamics

SUB CODE: 20,12

ABSTRACT: The article considers possible doubly logarithmic, asymptotic forms
of Feynman diagrams in quantum electrodynamics. All processes are classified
according to charge Z propagating in a t-channel intermediate state. The
authors thank I. A. MAL'KIN, I. Ya. POMERANCHUK, and Ye. S. FRADKIN for their
useful discussions. Orig. art. has: 3 figures and 4 formulas. [JPRS: 39,688]

Card 1/1

0929 1697

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

PROLOV, I.

Automatic assistants of locomotive engineers. IUn.tekh. 3
no.10:30-32 0 '58. (MIRA 11:11)
(Railroads--Automatic train control)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

FROLOV, I.

Command center of a gliding station. Kryl.rod. 13 no.12:19 D '62.
(MIRA 16:2)

1. Nachal'nik Penzenskoy planernoy stantsii.
(Gliding and soaring)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

R O L O V , I

Atomic energy: 1 flot; atomic energy (Atomic Energy and the Navy's Collection of Articles) Moscow: Sovetskaya, 1959. 232 p. (Series: Nauchno-populyarnaya biblioteka) Number of copies printed not given.

M. I. M. N. Nesterov, Capt., Ed.; A. M. Gavrilova, Ed. and Compiler; L. D. Chernous, No. Engineer, Captain.

PURPOSE: This book is intended for the general reader.

CONTENT: The purpose in this collection discusses in popular style, and on the basis of data published in the Soviet and non-Soviet press, problems of the collection use of atomic and hydrogen weapons in combat operations at sea. The collection includes reports on the destructive factors of a nuclear explosion and on the damage power of this weapon, of its destruction. A number of articles are devoted to the utilization of atomic energy for peaceful purposes, and to the use of nuclear energy in medicine. Papers discuss the use of nuclear energy in naval vessels, the utilization of nuclear power plants in naval vessels. Also included in the collection are papers dealing with the nature of the world's first atomic submarine, the "Lenin", which is expected to play an important part in the further conquest of the Arctic regions. The collection also contains papers published in the journal "Soviet Flot" in 1955-1958, in revised and supplemented form.

PURPOSE: This book is intended for the general reader.	
Author:	A. Nesterov, Capt., Engineer Captain; L. D. Chernous, No. Engineer
Editor:	A. M. Gavrilova, Ed.
Number of copies printed:	232
Place of publication:	Moscow: Sovetskaya, 1959.
Language:	Russian
Number of pages:	232
Size of book:	18x24 cm
Price:	1.50 rubles
Classification:	General
Subject:	Atomic energy
Notes:	Collection of articles from Soviet and non-Soviet press.
Source:	Soviet Flot (1955-1958)
Notes:	Revised and supplemented version.
Availability:	Library of Congress (19767.639)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

SOV/85-58-10-9/34

AUTHOR: Frolov, I., Civilian Pilot 1st Class

TITLE: The Joy of Creative Work (Radost' tvorcheskogo truda)

PERIODICAL; Kryl'ya rodiny, 1958, Nr 10, p 7 (USSR)

ABSTRACT: The author, 42, compares his age to that of Soviet aviation. He has had experience flying the U-2, R-5, Li-2 and the Tu-104 jet passenger plane. He has covered more than 4 million km. in the air on domestic and foreign air lines and has 16,000 hours of flying to his credit. He was awarded the Order of Lenin for his record in safe flying. There is 1 photograph of the author.

Card 1/1

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

FROLOV, I., inzhener-kapitan 2-go ranga

Radioactive contamination of a ship. Starsh.-serzh. no.8:36
Ag '62. (MIRA 15:8)
(Radioactive fallout) (Decontamination (from gases, chemicals, etc.)
(Ships--Sanitation)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

FROLOU, I.

JUN 25 1963

PHASE I BOOK EXPLOITATION

SOV/6261

Kernenergie und Flotte; Artikelsammlung (Nuclear Energy and the Navy; Collection of Articles) [Berlin] Deutscher Militärverlag [1961]. 232 p. Errata slip inserted. 2000 copies printed.

Translation from the Russian of: Atomnaya energiya i flot.

Translator: Erika Steuk, Lieutenant Commander. Responsibility for German edition: Claus Gruszka, Engineer; Ed.: Klaus Krumsieg.

PURPOSE: This collection of articles is intended for officers of the army, coast guard, and merchant marine.

COVERAGE: The book, a translation from the Russian, contains 25 articles dealing with the application of nuclear weapons to naval combat operations. Chapters 19 and 25 have been supplemented with additional data for this edition. The devastating features of nuclear explosions are discussed. Attention is also given to the protection of personnel, ships, and coastal facilities against nuclear weapons, and to the present and future applications of nuclear

Card 1/6

Nuclear Energy and the Navy (Cont.)

SOV/6261

- | | |
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| 5. <u>I. Frolov</u> , Engineer Commander (Navy). Primary Penetrating Radiation | 58 |
| 6. A. Aleksandrov, Engineer Lieutenant Colonel, and O. Kogtev, Major Engineer. The "Foot Wave" and Its Damaging Effect | 66 |
| 7. I. Frolov. Ionizing Contamination | 70 |
| 8. P. Abrosimov, Captain (Navy), and V. Vladimirov, Engineer Captain (Navy). Protecting a Ship Against Nuclear Weapons | 78 |
| 9. G. Migirenko, Captain (Navy), Professor, Doctor of Engineering. Protecting a Ship Against Explosions | 86 |
| 10. P. Abolishin, Captain (Navy). Means of Protection Against Nuclear Weapons in Foreign Navies | 93 |
| 11. P. Khokhlov, Engineer Captain (Navy), Candidate of Technical Sciences. Nuclear Protection of Light-Class Ships | 100 |

Card ~~5/6~~

2/2

FROLOU, I.

PHASE I BOOK EXPLOITATION

SOV/6261

Kernenergie und Flotte; Artikelsammlung (Nuclear Energy and the Navy;
Collection of Articles) [Berlin] Deutscher Militärverlag [1961].
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PURPOSE: This collection of articles is intended for officers of the
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combat operations. Chapters 19 and 25 have been supplemented with
additional data for this edition. The devastating features of nu-
clear explosions are discussed. Attention is also given to the
protection of personnel, ships, and coastal facilities against nu-
clear weapons, and to the present and future applications of nuclear
power plants to shipping. No personalities are mentioned. There
are 16 references: 10 Russian (including 3 translations from
English-language sources), 1 French, 1 German, 1 English, 1 Ameri-
can, and 2 either English or American.

Nuclear Energy and the Navy (Cont.)

SOV/6261

5. I. Frolov, Engineer Commander (Navy). Primary Penetrating Radiation 58
6. A. Aleksandrov, Engineer Lieutenant Colonel, and O. Kogtev, Major Engineer. The "Foot Wave" and Its Damaging Effect 66
7. I. Frolov, Ionizing Contamination 70
8. P. Abrosimov, Captain (Navy), and V. Vladimirov, Engineer Captain (Navy). Protecting a Ship Against Nuclear Weapons 78
9. G. Migirenko, Captain (Navy), Professor, Doctor of Engineering. Protecting a Ship Against Explosions 86
10. P. Abolishin, Captain (Navy). Means of Protection Against Nuclear Weapons in Foreign Navies 93
11. P. Khokhlov, Engineer Captain (Navy), Candidate of Technical Sciences. Nuclear Protection of Light-Class Ships 100

Card 3/6

2/32

1

Nuclear Energy and the Navy (Cont.)

SOV/6261

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| 12. | <u>V. Galin</u> , Engineer Colonel. Nuclear Protection of Coastal
Installations | 106 |
| 13. | <u>I. Frolov</u> . Detection of Radiation | 120 |
| 14. | <u>M. Alekseyev</u> , Engineer Lieutenant Colonel. Deactivation
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| 15. | <u>N. Polyakov</u> , Engineer Captain (Navy). Protecting a Ship
Against Ionizing Contamination | 135 |
| 16. | <u>P. Khokhlov</u> . Living Conditions of the Crew on Board Ship | 141 |
| 17. | <u>Ye. Nikiforov</u> , Lieutenant Colonel of Medical Service.
Sanitary Management Aboard Ship | 145 |
| 18. | <u>A. Egorov</u> , Captain (Navy), Docent, Candidate of Historical
Sciences. Nuclear Weapons and Naval Tactics | 151 |

Card 476 3/3

FROLOV, I. A.

DVORKOVSKIY, B.B., elektromekhanik; FROLOV, I.A., starshiy elektromekhanik

Magnetic sound recording for broadcasting on trains. Avtom.elem.
i svias' no.7:25-28 J1 '57. (MLRA 10:8)

1. Moskovsko-Kursko-Donbasskaya dorega.
(Magnetic recorders and recording)

FROLOV, I.A.; MAKAROV, V.G., elektromekhanik

Magnetic recording head polishing device. Avtom., telem. i sviaz' 2
(MIRA 13:1)
no.3:23-24 Mr '58.

1. Starshiy elektromekhanik Moskovskoy distantsii signalizatsii i svyazi
Moskovsko-Kursko-Donbasskoy dorogi (for Frolov).
(Magnetic recorders and recording)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

BERNGRAD, K.A., doktor tekhn.nauk; VASIL'YEV, G.S., kand.tekhn.nauk;
BIKCHENTAY, M.A., inzh.; FROLOV, I.A., inzh.

Ways for traffic control automation in large railroad junctions.
Vest.TSNII MPS 19 no.6:3-8 '60. (MIRL 13:9)
(Automatic control) (Railroads---Train dispatching)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

FROLOV, I.A., inzh.

Automatically controlled recordings on graphs of the performed movements. Vest.TSNII MPS 20 no.3:61-64 '61. (MIRA 14:5)
(Railroads--Train dispatching)
(Automatic control)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

L 41852-55

ACCESSION NO. A15006618

BOOK EXPLOITATION

8/

Pashmin, T. A. (Candidate of Economic Sciences); Meshova, R. V. (Candidate of Technical Sciences); Oloynik, O. A. (Engineer); IUDina, N. V.; Borngard, K. A. (Doctor of Technical Sciences; Professor); Pralov, I. A. (Engineer); Tsvonchuk, Yu. N. (Candidate of Economic Sciences)

Organization of the railroad transportation of petroleum and chemical liquid freight (Organizatsiya shleoznudorozhnykh perevozok neftyanikh i khimicheskikh naivnykh grusov), Moscow, Izd-vo "Transport", 1964, 119 p. illus., biblio. 1,500 copies printed. Series note: Moscow. Vsesoyuznyy nauchno-issled-ovatel'skiy institut shleoznudorozhnogo transporta. Trudy. vyp. 279.

TOPIC TAGS: railroad transportation, oil product, chemical, railroad tank car, railroad freight organization

PURPOSE AND COVERAGE: This book presents a brief analysis of the freight traffic of oil, oil products and chemicals carried in railroad tank cars. It considers problems of specialization in the types of tank cars, equipping special stations for sorting and processing empty tank cars, routing freight, and the concentration of the discharge of oil products at the least number of

Card 1/3

L 41862-65
ACCESSION NR AM5006618

stations. The book is intended for researchers, engineers, and technicians of railroad transportation, industry, and other organizations involved in the transportation of petroleum and chemical freight. The book was written by Candidate of Economic Sciences, T. A. Pakhman (Ch. 1, Section 1), Candidate of Technical Sciences, R. V. Mezhova (Ch. 1, Sections 2 and 3, Ch. 2, Sections 1 and 2), Engineers, O. A. Oleynik and N. V. Yudina (Ch. 1, Section 4), Doctor of Technical Sciences, Professor, K. A. Borngard (Ch. 2, Sections 3 and 4, Ch. 3, Sections 1, 2 and 3, Ch. 3, Sections 4, 5, 6 and 7), Candidate of Economic Sciences, Yu. N. Tikhonchuk (Ch. 5). Assistance in the calculations was provided by Engineers, N. M. Avakyan and R. M. Shekerbina.

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Foreword — 3
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Ch. II. Organization of the flow of railroad tank cars — 17
Ch. III. Specialization in the types of tank cars and the description of washing-steaming stations — 43
Ch. IIII. Special sorting stations for the preparation of tank cars for discharge — 76

Card 2/3

L 41862-65
ACCESSION NR AM5006618

Ch. V. Concentration of discharge points of petroleum products -- 101
Bibliography -- 118

SUBMITTED: 22Jun64

SUB CODE: 00

NO REF Sov: 012

OTHER: 008

Card 3/3

KRILOV, I.A.; ASLIBIKH, N.Kh.; DEVYATYKH, G.G.

Laboratory wetted-glass wall rectification column. Zav.lab.
28 no.6:750 152. (MFA 15:5)

1. Gor'kovskiy gosudarstvennyy universitet imeni N.I.
Lobachevskogo,
(Distillation apparatus)

AGAFONOV, I.L.; DEVYATYKH, G.G.; FROLOV, I.A.; LARIN, N.V.

Mas spectrum of monogermane. Zhur. fiz. khim. 36 no.6:1367-
1368 Je'62 (MIRA 17e?)

1. Gor'kovskiy universitet imeni Lobachevskogo.

5(4), 10(4)

AUTHORS:

Devyatykh, G. G., Agliulov, I. Kh.,
Trolov, I. A.

SC7/76-33-1-27/5

TITLE:

The Influence of the Velocity of the Distillate Withdrawal on
the Separating Efficiency of Rectification Columns (Vliyanie
skorosti otbora destillyata na rasdelitel'nuyu sposobnost'
rektifikatsionnykh kolonn)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 161-164
(USSR)

ABSTRACT:

In this investigation Cohen's theory (Koen)(Ref 1) is tested experimentally. The function between the withdrawal quantity and the concentration of the component under consideration in the withdrawal was investigated, starting from the assumption that the velocity of the substance exchange of the phases depends on the difference of the equilibrium concentration and the current concentration of the component under consideration. The conditions of a rectification column without withdrawal (Fig 1) were explained by using Cohen's material balance equation; likewise, the conditions of a column with withdrawal were explained. The equations deduced were verified at a distillation with various withdrawals of a

Card 1/2

The Influence of the Velocity of the Distillate SCV/76-55-1-27/45
Withdrawal on the Separating Efficiency of Rectification Columns

benzene-diethane chloride mixture on two rectification columns with the effect of 35 theoretic plates. A description of the column and dimension data are given. The analyses were carried out by means of an Abbé-refractometer. Six series of tests were carried out (Figs 2, 3). The experimental data obtained correspond to those obtained from the equation deduced. Cohen's equation, however, shows lower values of the allowed withdrawal velocity. There are 3 figures and 2 references.

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet
(Gor'kiy State University)

SUBMITTED: July 4, 1957

Card 2/2

PETROV, A.P., doktor tekhn. nauk, prof.; DUVALYAN, S.V., kand. tekhn. nauk; ABADUROVA, Ye.V., inzh.; ZHURAVLEV, M.M., inzh.; KHANDKA.OV, Yu.S., inzh.; SAMARINA, N.A., inzh.; ZAV'YALOV, B.A., kand. tekhn. nauk; BERNGARD, K.A., doktor tekhn. nauk, prof.; VASIL'YEV, G.S., kand. tekhn. nauk; BIKCHENTAY, M.A., inzh.; FROLOV, I.A., inzh.; SIDEL'NIKOV, V.M., inzh.; MOKROUSOVA, N.I., inzh.; POZAMANTIR, E.I., kand. tekhn. nauk; GLUZHBERG, E.A., rotsenzent; MAKSIMOVICH, B.M., kand. tekhn. nauk, retsenzent; PREDE, V.Yu., inzh., red.

[Use of electronic digital computers in compiling train sheets] Sostavlenie grafika dvizheniya poездов na elektronnykh tsifrovых vychislitel'nykh mashinakh. Moskva, Transportizdat, 1962. 199 p. (MIRA 15:9)

1. Chlen-korrespondent Akademii nauk SSSR (for Petrov).
(Railroads--Train dispatching)
(Railroads—Electric equipment)

DEVVATYKH, G.G.; FROLOV, I.A.

Vapor pressure of liquid germane. Zhur.neorg.khim. 8 no.2:265-268
F '63. (MIRA 16:5)

1. Naukno-issledovatel'skiy institut khimii pri Gor'kovskom
gosudarstvennom universitete imeni N.I.Lobachevskogo.
(Germanium hydrides) (Vapor pressure)

F. D. I.

Castings Metals for Diesel piston rings. J. I. Frith,
Metallurgist, Proceedings 1937, No. 7, p. 5. These blanks are
dry-cast at 1180-1400° by using iron castings. C_(max) 4-
2.8-3.2, C_(min) 0.6-0.9, Si 1.3-1.7, Mn 1.0-1.5, and P 0.3-
0.5%. The blanks have the structure of sorbitic pearlite
and retain their elasticity and tightness at 350-70°. Practice
is detailed and the properties of castings are discussed.
J. D. G.

Re

W.H.

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

ZHUKOV, V.F.; FROLOV, I.I.

Development of the process of thawing and compacting permafrost before building. [Trudy] NII osn. no. 50:72-79 '62.
(MIRA 16:9)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

FROLOV, I.I.

A year's work with a semisoluble base. Bum. prom. no.3:
10-12 Mr '64.
(MIRA 17:3)

1. Glavnnyy inzh. Okulovskogo kombinata.

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

FROLOV, I. K.

Frolov, I. K. - "The development of commerce and the growth of commercial networks in large cities", Gor. Khoz-vo Moskvy, 1947, No. 1, p. 9-16.

SO: U-3042, 11 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 8, 1949).

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

FROLOV, I.K., nachal'nik.

Development of industries for the servicing of the community. Gor.khos.
Mosk. 27 no.10:15-17 0 '53. (MLRA 6:11)

1. Gorodskoye upravleniye predpriyatiy kommunal'nogo obsluzhivaniya.
(Moscow---Municipal services) (Municipal services--Moscow)

FROLOV, I.K.

For further improvement in the work of communal service enterprises.
Gor.khoz.Mosk.30 no.1:26-27 Ja '56.
(MLRA 9:6)

1.Nachal'nik Upravleniya predpriyatiy kommunal'nogo obsluzhivaniya
Mosgorispolkoma.
(Moscow--Municipal services)

ZAGRYATSKIY, I.V.; PROLOV, I.M.; KISELEV, S.M.

Drying enameled ware by combustion gases. Prom.energ. 11 no.8:
19-21 Ag '56. (MLRA 9:11)
(Enameled ware) (Drying apparatus)

FROLOV, I. A.

FROLOV, Ivan Mikhaylovich; MISHKEVICH, G.I., otvetstvennyy red.; FRUMKIN, P.S.,
tekhn.red.

[The technique of multiple reproduction of drawings] Tekhnika
razmnozheniya chertezhei. Leningrad, Gos. soiuznoe izd-vo sudostroit.
promyshl., 1957. 66 p. (MIRA 11:2)
(Blueprinting)

FROLOV, Ivan Mikhaylovich; FAL'SKIY, V.F., red.; ATROSHCHENKO,
L.Ye., tekhn. red.

[Star pilots] Zvezdnye piloty. Moskva, Izd-vo "Znanie,"
1962. 60 p. (MIRA 15:8)
(Astronauts)

FROLOV, Ivan Mikhaylovich; MOKSHIN, Stepan Ivanovich; BELYAKOV, V.,
red.; DANILINA, A., tekhn.red.

[Flying among stars] Letiashchie sredi zvezd.... Moskva,
Gospolitizdat, 1963. 47 p.

(MIRA 16:6)

(Bykovskii, Valerii Fedorovich)
(Tereshkova, Valentina Vladimirovna)

FROLOV, Ivan Mikhaylovich; MOKSHIN, Stepan Ivanovich; NOVOKHATKO,V.,
red.

[Three on the stellar route; story of the world's first
team flight on the Soviet multiseat space vehicle
"Voskhod."] Troe na zvezdnoi trasse; rasskaz o pervom v
mire ekipazhe sovetskogo mnogomestnogo kosmicheskogo ko-
rabilia "Voskhod." Moskva, Politizdat, 1964. 30 p.

(MIRA 17:12)

Frolov, I. N.

AUTHOR: Frolov, I.N., Engineer 128-58-4-9/18

TITLE: Centrifugal Casting of Cast Iron and Steel Parts (Tsentrobelnoye lit'ye chugunnykh i stal'nykh detaley)

PERIODICAL: Liteynoye Proizvodstvo, 1958, No. 4, pp 23-24 (USSR)

ABSTRACT: A centrifugal casting machine used at the Barnaul'skiy kotel'nyy zavod (Barnaul Boiler Plant), for casting boiler parts, is described and illustrated by a photograph. Two molds used with the machine are shown in drawings. The machine has eliminated all rejects at the casting level. The economic advantages of the centrifugal casting method are being emphasized.

There are 3 figures.

AVAILABLE: Library of Congress

Card 1/1 1. Industrial engineering 2. Castings-Economic aspects

FROLOV, I. N. (Engr.)

"The Centrifugal Casting of Important Iron and Steel Parts."

All-Union Conference of Foundry Workers. end of 1957. Moscow.
Mashinostroitel', 1958. No. 5, p. 48.

18.4000

81476
S/123/60/000/05/06/009

Translation from: Referativnyy zhurnal, Mashinostroyeniye, 1960, No 5, p 221,
22444

AUTHOR: Frolov, I.N.

TITLE: Replacing Forging and Hot Pressing by Centrifugal Casting¹⁸

PERIODICAL: Tekhn.-ekon. byul. (Sovmarkhoz Krasnoyarskogo ekon. adm. r-na),
1958, No 9, pp 17 - 20

TEXT: The author describes the practice of the Barnaul'skiy kotelnyy zavod (Barnaul Boiler Plant) in casting steel flanges and cast iron semi-couplings on vertical centrifugal machines. A distinguishing feature of this process is the variation of the numbers of revolution of the centrifugal machine during the pouring process, which ensures an intensive stirring of the metal and a fine-grained compact structure of the casting. The technical-economical indices of the process are given. The Plant has built a vertical centrifugal machine with automatic variation of the number of revolutions

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Replacing Forging and Hot Pressing by Centrifugal Casting

during the pouring process within the range of from 200 to 100 rpm. The number of metal agitations amounts up to 12 per minute. Castings with a diameter of up to 1,200 mm, a height of up to 1,000 mm and a weight of up to 1 t can be produced with this centrifugal casting machine.

6 figures.

L.K.P.

✓

Card 2/2

FROLOV, I.P.

Fungous diseases of grapes in Turkmenia. Izv. AN Turk.
SSR. Ser. biol. nauk no.5:29-35 '65.

1. Institut botaniki AN Turkmeneskoy SSR.

(MIRA 18:11)

L 3477-40 7 (5)/6 : 00-2
ACC NR: AT0012692

SOURCE CODE: UR/3136/65/000/991/0001/0044

AUTHOR: Goncharov, V. V.; Babulevich, Ye. N.; Shavrov, P. I.; Ryazantsev, Ye. P.
Novikov, I. M.; Yegorenkov, P. M.; Chervyatcov, A. A.; Frolov, I. P.; Zhigachev,
V. M.; Pushnin, B. T.; Fishevskiy, V. K.; Zakharov, L. K.; Kruglov, A. D.; Karasev,
N. A.; Goncharov, L. A.

ORG: State Committee on the Use of Atomic Energy SSSR, Institute of Atomic Energy
im. I. V. Kurchatov, Moscow (Gosudarstvennyy komitet po ispol'zovaniyu atomnoy
energii SSSR, Institut atomnoy energii)

TITLE: Experience in operation of the MR reactor and tests of fuel elements and
materials

SOURCE: Moscow. Institut atomnoy energii. Doklady, no. 991, 1965. Opyt eks-
pluatatsii reaktora MR i provedeniye ispytaniy TVEL i materialov, 1-44

TOPIC TAGS: nuclear research reactor, reactor fuel element, nuclear reactor
material, nuclear reactor characteristic

ABSTRACT: The authors discuss the loop research reactor MR constructed at the
Kurchatov Institute of Atomic Energy and intended for the test of fuel elements
and materials in new atomic installations. It is described in paper P/323 of the
Third Geneva Conference in 1964. The present article describes in detail its con-

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construction and the various test loops in it. The section headings are: I - Introduction. II. Operation of reactor. 1. Certain physical characteristics of the reactor. a) Fuel burnup. b) Efficiency of control valves, scium rods, and movable fuel assemblies. c) Fluxes of thermal and fast neutrons. 2. Control and protection system of the reactor. 3. Technological systems of the reactor. a) Cooling loop for fuel element assembly. b) Cooling loop for the reactor assembly blocks. c) Intermediate (second) cooling loop of reactor. d) Third cooling loop of reactor. e) Water purification system. 4. Fuel assembly operating conditions and conditions for the graphite stacking blocks. 5. Reloading operations. III. Operation of loop installations. Organization and performance of tests on fuel elements and materials. IV. Dosimetric control. Radiation shielding of reactor. The reactor has been in operation since 24 July 1964, and its power has been gradually increased from the initial 20 MW to 30 MW. The usual operation is at 25 MW. The reactor has 3 loop channels with 7 associated experimental channels. Various characteristics of the reactor at different power ratings are tabulated. Major contributions to the adjustment of the MR reactor were made by A. Ye. Alekseyev, B. A. Alekseyev, S. N. Begichev, A. B. Bugayenko, Yu. I. Kovalev, V. K. Lebedev, A. M. Rotankov, V. D. Rusov, N. V. Sarychev, Ye. S. Chernorotov, and Yu. A. Shikov.

Orig. art. has: 13 figures and 6 tables.

SUB CODE: SUBM DATE: 00/ ORIG REF: .001

Card 2/21/24

Approved for Release: 06/13/2000 CIA-RDP86-00513R000513810003-0

✓ Refractive index of water and of aqueous sodium sulphate solutions in the region of medium radioelectromagnetic waves. I. G. Bulyar (Podolsk, Inst. of Phys. Chem., USSR). Zhur. Russ. fiz.-mat. Fiz., 27, 477 (1961).
The refractive index of water at 10° was found to be 1.387 ± 0.018 (by a total of 60 readings taken at intervals of 0.001 increase in temp.). The cond. of water decreased from 1.3×10^{-8} in the beginning of expt. to 1.1×10^{-8} at the end. In the region from 10° to 14° the cond. of $\text{H}_2\text{O} \cdot \text{Na}_2\text{SO}_4 \cdot 10^{-8} \text{ ohm}^{-1} \text{ cm}^{-1}$ of a solution of 25 g. a mole/liter taken at every 3 mm. interval. After the addition of $10 \text{ g. } 10^{-3} \text{ mol/liter}$ of Na_2SO_4 . With an increase of temp. from 10° to 14° a linear decrease of the ϵ_1 of water and of Na_2SO_4 takes place. An increase in the cond. of H_2O increases its ϵ_1 , and at 14° the increase is about 8% greater than in water. It is assumed that in the region of wave lengths studied the dielectric permeability of water is a function of the concentrated and independent of the frequency of the electromagnetic field. 27 references. A. P. E.

FROLOV, I.

RABINOVICH, MS.; FROLOV, I.

Practice work in industry by physics students of a pedagogical institute. Politekhnobuch. no.8:34-72 Ag '57. (MLRA 10:9)

1. Ul'yanovskiy pedagogicheskiy institut.
(Education, Cooperative) (Physics--Study and teaching)

AUTHORS: Demokritov, N.A., Frolov, I.S., Docents SOV/3-58-12-36/43

TITLE: Bibliography (Bibliografiya) A Detailed and Complete Course
(Obstoyatel'nyy i polnyy kurs)

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 12, pp 84-86 (USSR)

ABSTRACT: This is a review of K.A. Putilov's book "Course in Physics",
2nd volume, "The Science of Electricity". It is published
by Gostekhtheoretizdat.
There are 2 Soviet references.

ASSOCIATION: Ul'yanovskiy pedagogicheskiy institut imeni I.N. Ul'yanova
(Ul'yanovsk Pedagogical Institute imeni I.N. Ul'yanov)

Card 1/1

FROLOV, I.S.

Theory of generalized almost periodic sequences. Dokl. AN
SSSR 165 no.3:493-496 N '65. (MIRA 18:11)

1. Moskovskiy gosudarstvennyy universitet. Submitted March 26,
1965.

FROLOV, I.T., aspirant.

Expediency in nature. Nauka i zhizn' 23 no.8:42-45 Ag '56.
(MIRA 9:9)

1.Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Nature study)

FROLOV, I.T.

Dialectical materialistic determinism in biology [with summary in English]. Bot. zhur. 43 no.6:799-813 Je '58. (MIRA 11:?)
(Variation (Biology)) (Science--Philosophy)

FROLOV, Ivan Timofeyevich

FROLOV, Ivan Timofeyevich; GARKAVENKO, F.I., redaktor; GUBIN, M.I.,
tekhnicheskij redaktor

[Does purpose exist in living nature; Darwinism and teleology]
Sushchestvuet li tselesobraznost' v zhivoi prirode; darvinizm i
teleologija. Moskva, Izd-vo "Znanie," 1957. 29 o. (Vsesoiuznoe
obshchestvo po rasprostraneniju politicheskikh i nauchnykh znanii.
Ser.2, no.24)
(Evolution) (MLRA 10:10)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

FROLOV, Ivan Timofeyevich; VORONOV, A.I., red.; NAZAROVA, A.S., tekhn.
red.

[Philosophical problems in modern biology] Filosofskie problemy
sovremennoi biologii. Moskva, Izd-vo "Znanie," 1961. 31 p.
(Vsesoiuznoe obshchestvo po rasprostraneniuu politicheskikh i
nauchnykh znanii. Ser.2, Filosofija, no.16) (MIRA 14:9)
(Biology—Philosophy)

APPROVED FOR RELEASE: 06/13/2000

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31822
S/194/61/000/010/018/082
D222/D301

AUTHOR: Frolov, I.T.

TITLE: Gnosiological problems of modelling biological systems

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 10, 1961, 9, abstract 10 B65 (Vopr. filosofii, 1961, no. 2, 39-51, 184)

TEXT: The effectiveness of modelling as an auxiliary method in the scientific analysis of biological problems is discussed. A detailed examination is given of the definition of the concept of "modelling" as a material or mental imitation of an actual system through the construction of special analogues, in which the principles of organization and functioning of this system are reproduced. The models used in technology and in biology differ because the technological models can be made scaled ones, only quantitatively deviating from the original (e.g. the model of a

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Gnosiological problems...

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dam, of an antenna, and others), while biological models will almost always show qualitative deviations. The biological model can be either artificial or natural (a lower organism in relation to a higher one). The modelling of biological processes is in principle a new approach to problems related to the artificial reproduction of not only the functional features of living systems, but also of their structural organization. The properties of biological objects as systems are considered and it is established that they are open systems, constantly exchanging matter and energy with their environment, having a constant entropy in the state of dynamic equilibrium. It is shown that models of biological objects enable the accurate qualitative study of the specific laws which characterize the functioning of organically complete living systems. [Abstracter's note: Complete translation]

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Card 2/2

FROLOV, Ivan Timofeyevich; VIKTOROVA, V.Ye., red.; KOBYAKOV, G.G.,
ml. red.

[Methodology of biological research in outline; the system
of biological methods] Ocherki metodologii biologicheskogo
issledovaniia; sistema metodov biologii. Moskva, Mysl',
1965. 285 p. (MIRA 18:7)

PROLOV, K.

Inventors and efficiency promoters are entitled to daily assistance.
Muk.-elev.prom 22 no.9 3-4 S '56. (MLRA 10:8)

1. Ispolnyayushchiy obyazannosti nachal'nika tekhnicheskogo
Ministerstva khleboproduktov SSSR.
(Grain trade)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

Frolov K.
FROLOV, K., inzh.

From small mills to a big combine in Tomsk. Muk.-elev. prom. 23
no. 11:31-32 N '57. (MIRA 11:1)

1. Tekhnicheskiy otdel Ministerstva khleboproduktov SSSR.
(Tomsk--Grain milling)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

FROLOV, K., inzh.

Increasing the productivity of grain dryers and improving grain
cleaning at grain-procurement stations. Muk.-elev. prom. 25 no.11:
11-13 N '59. (MIRA 13:3)

1. Nachal'nik Technicheskogo upravleniya Ministerstva khleboproduktov
RSFSR.
(Grain--Drying) (Grain--Cleaning)

FROLOV, K., inzh.

Committees for furthering technical progress, Muk.-slev.prom.
25 no.12:8-9 D '59. (MIRA 13:4)

1. Nachal'nik Tekhnicheskogo upravleniya Ministerstva
khleboproduktov RSFSR.
(Grain-handling machinery)
(Grain-milling machinery)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0

KOSAY, I.; FROLOV, K.

Organization and technical measures for shifting to the seven-hour
labor day. Avt.transp. 38 no.6:34-37 Je '60. (MIRA 14:4)
(Hours of labor)

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000513810003-0"

FADLOV, A.

Make savings in small and large items. Mest. prom. i khud.
promys. 2 no. 6:22-23 Je '61. (MIRA 14f7)

1. Nachal'nik finansovogo upravleniya Gosmestproma.
(Cost, Industrial)

YARLONSKIY, V.S., KORNILOV, G.G., FROLOV, K.D., NECHVAL¹, M.V.

Effect of the profile of pipeline routes and specific gravity differences of petroleum products on their mixing in consecutive pumping. Neft. khoz, 38 no.6:55-61 Je '60.
(Petroleum--Transportation)

YABLONSKIY, V.S.; KORNILOV, G.G.; FROLOV, K.D.; NECHVAL', M.V.

Factors influencing the mixing of petroleum and petroleum products
in consecutive pumping. Trudy NIITransneft' no.1:118-132 '61.

(MIRA 16:5)

(Petroleum pipelines--Fluid dynamics)

YABLONSKIY, V.S.; KORNILOV, G.G.; FROLOV, K.D.; NECHVAL', M.V.

Mixing of fluids during stoppages in consecutive pumping. Trudy
NIITransneft' no.1:133-145 '61.
(Petroleum pipelines--Fluid dynamics)

FROLOV, K.D.; GOLUBEV, B.N.

Number of cycles in consecutive pumping. Transp. i khran.
nefti i nefteprod. no. 1:11-16 '61. (MIRA 17:5)

1. Nauchno-issledovatel'skiy institut po transportu i khraneniyu
nefti i nefteproduktov.

FROLOV, K.D.

Mixing of petroleum products of varying viscosity in pipes.
Transp. i khran. nefti i nefteprod. no.12:3-5 '64.

(MLRA 18:2)

1. L'vovskiy politekhnicheskiy institut.

BOCHAROV, V.I., inzh., otv. za vypusk. Prinimali uchastiye: SHESTAKOV,
A.N., inzh.; ~~PROLOV~~, K.I., inzh.; SYSOYENKO, N.A., inzh.;
MOISEYeva, V.G., inzh.; SIMAKOV, V.I., tekhnik; SEROV, V.I.,
tekhnik; BOBROVA, Ye.N., tekhn.red.

[Album of drawings of electric machinery of the N8 and VL23
electric locomotives] Al'bom chertezhei elektricheskikh mashin
elektrovozov N8 i VL23. Moskva, Vses.izdatel'sko-poligr. ob'edini-
enie M-va putei soobshcheniiia, 1960. 325 p. (MIRA 13:10)

1. Novocherkasskiy elektrovozostroitel'nyy zavod.
(Electric locomotives)

BOCHAROV, V.I., inzh., otv. za vypusk; SHESTAKOV, A.N., inzh.;
FROLOV, K.I., inzh.; SOTNIKOV, I.A., inzh.; SYSOYENKO,
N.A., inzh.; MOISEYEVA, V.G., inzh.; SIDAKOV, V.M.,
inzh.; PREDKOV, A.G., inzh.; KHITROVA, N.A., tekhn. red.

[Album of drawings of electric machinery and transformer
equipment for the VL60 electric locomotive] Al'bom cher-
tezhei elektricheskikh mashin i transformatornogo oboru-
dovaniia elektrovoza VL60. Moskva, Transzheldorizdat,
1963. 353 p. (MIRA 16:12)

1. Novocherkasskiy elektrovozostroitel'nyy zavod.
(Electric locomotives--Design and construction)

FROLOV, K.K.

Wages for drivers and repair workers. Avt.transp. 41 no.11:
39-41 N '63. (MIRA 16:12)

1. Starshiy inspektor Gosudarstvennogo komiteta Soveta Ministrov
SSSR po voprosam truda i zarabotnoy platy.